

wheat depends almost exclusively on the quantity of nitrogen in the grains; those containing relatively the least of it, being at the same time the most perfectly developed; they are the heaviest, largest in size, and produce the finest quality of flour. The application of nitrogen to soils, (in the form of ammonia,) therefore, not alone increases the yield of the crop far above the proportion which we at first should anticipate; but it also improves the quality of the produced grain, and thus secures for it the highest price in market.

It has already been remarked that the quantity of ammonia which a soil contains, or is capable of producing, is generally in proportion to the quantity of humus in it. This latter substance, though free of nitrogen itself, is always accompanied by nitrogenous matters, which, as integrant parts of the plant, necessarily decay with its whole body, and becomes thus intimately incorporated with the humus produced. The nitrogen amounts to about 1-15 of the quantity of carbon of which the humus is composed.

But there is, independently of the supply of ammonia by humus, another source for the acquisition of this nutriment, which is inherent to the body of the soil at large, and therefore also dependent on the mechanical texture of the soil. It has been proven that all soils have more or less the property of attracting the ammonia contained in the atmosphere, and to retain it in a state of combination, which so tightly locks it up in the body of the soil, that it is impossible to extricate it again with water. Water even, which has been saturated with ammoniacal salts, if suffered to filter through soil, runs off clear at the expense of the ammonia formerly contained in it; as also an atmosphere charged with gaseous ammonia is deprived of it when brought in contact with soil. In all these cases the ammonia is found to have been appropriated by, and incorporated with the soil. Prof. Way recently discovered by his most tedious labors, that a certain class of artificial double silicates exercise, in this respect, a power similar to that of soils, and, for several reasons, he concluded that it was to the presence of portions of these double silicates that soils owed the power above alluded to. Among them the double silicate of lime and alumina was found to be that to which this absorptive power of soils has chiefly to be attributed; this substance is a constituent part of clay, through the mass of which it is diffused in minute particles, and therefore never absent in soils. But if, in accordance with the above, the power of soils for absorbing ammonia is increased with the quantity of clay in them, it is on the other side necessarily lessened again in proportion to the degree of stiffness